## REMARKS

In response to the Office Action dated April 23, 2003, a reconsideration of the present application is respectfully requested. Claim 1 has been amended. Claims 22-25 have been withdrawn without prejudice or disclaimer. No other claims have been added, amended or withdrawn. Therefore, claims 1-21 are currently pending in the present application.

Claims 1-11 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the applicant regards as the invention. The Examiner stated that Claim 1 recited the limitation "said changes" in line 4 and there was insufficient antecedent basis for that limitation. Claim 1 has been amended and Applicants respectfully request that the rejection based upon 35 U.S.C. § 112, second paragraph be withdrawn.

Claims 1-5, 8, 12-17, 19, and 20 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Seki et al. (JP-152084) in view of Seong-Don Hwang et al. (70 Appl. Phys. Lett 1028, 1997). None of the above references of record teach or suggest a semiconducting boron carbide layer that is an "electrically active" semiconductor part of the detection device as recited in claim 1. The specification of the present application does define the term "electrically active." Specifically, the specification of the present invention states that the property of being electrically active – a property possible for semiconductors but not metallically conducting materials – enables the dense ionization caused by the lithium ion and the alpha particle, the reaction products of neutron capture by boron-10 in the said electrically active layer, to result in electron-hole pairs that may largely be swept out, and collected, from that electrically active layer by electric fields applied across the layer. See Specification, page 8, lines 25-29; see also

page 3, line 13 (stating the boron carbide semiconductor uses its electrical properties as a semiconductor rather than its electrical property of resistance).

The Seki et al. reference discloses employing boron as neutron capturing layers that do not function as semiconductors and that are not electrically active parts of their semiconductor neutron detector. The Seki et al. boron layers function as sensing layers that are external to the semiconductor region wherein electron-hole pairs can be generated. This disclosure is further described in their claim 1 in which they refer to "a monocrystalline semiconductor substrate and an amorphous semiconductor layer which forms a heterojunction between them and electrodes which contact said monocrystalline semiconductor and said amorphous semiconductor layer on the opposite sides of said junction" combined with their statement which reads "The boron thin film 4 on the rear side plays a role for the a-ray generation by a neutron ray penetrating the monocrystalline silicon plate 1 in addition to the ohmic contact formation for the crystalline plate 1." See Seki et al. reference, page 2, Claims portion and page 9, lines 6-9. The associated figure on page 11 shows the layer 4 in contact with the layer 1. Thus, the Seki et al. reference is stating that the boron / silicon interface provides an electrical contact that follows Ohm's law, just like a metal and unlike a semiconductor p-n or Schottky junction. Thus, in no way should Seki et al. therefore be interpreted as using boron in semiconducting form in any way comparable to the Applicant's approach.

Further, the Seong-Don Hwang et al. reference also does not disclose the boron carbide layer being an electrically active part of the detection device. The Seong-Don Hwang et al. reference discloses that a boron carbide semiconductor homojunction diode can be made and does yield electrical characteristics as a diode. Further, it refers to n-type and p-type forms of semiconducting boron carbide, the n-type being obtained by incorporation of a metal dopant into

material that would otherwise be p-type. This reference does not disclose anything about neutron detection or a boron carbide layer being an "electrically active" part of the detection device.

Therefore, since none of the references of record either when considered singly or in combination with each other, teach or suggest the "electrically active" limitation contained in independent claim 1, Applicants respectfully request withdrawal of the rejection of claim 1 for at least the above reasons. As claims 2-11 depend either directly or indirectly from claim 1, these claims are believed to be in condition for allowance for at least the above cited reasons. As such, Applicants respectfully request withdrawal of the § 102(b) rejection of claims 1-11. Each of claims 1-11 are believed to be in condition for allowance and such favorable action is respectfully requested.

Independent claim 12 also includes the "electrically active" limitation as contained in claim 1. Thus applicants respectfully request withdrawal of the § 102(b) rejection of claim 12 for at least the above reasons. Therefore, for the reasons set forth above, independent claim 12 is now believed to be in the condition for allowance and such favorable action is respectfully requested.

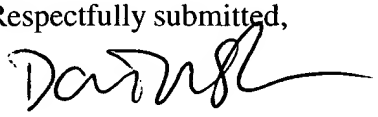
Independent claim 13 also includes the "electrically active" limitation as contained in claim 1. Thus applicants respectfully request withdrawal of the § 102(b) rejection of claim 13 for at least the above reasons. Therefore, for the reasons set forth above, independent claim 13 is now believed to be in the condition for allowance and such favorable action is respectfully requested.

Independent claim 14 also includes the "electrically active" limitation as contained in claim 1. Thus applicants respectfully request withdrawal of the § 102(b) rejection

of claim 14 for at least the above reasons. Therefore, for the reasons set forth above, independent claim 14 is now believed to be in the condition for allowance and such favorable action is respectfully requested. As claims 15-21 depend either directly or indirectly from claim 14, these claims are believed to be in condition for allowance for at least the above cited reasons. As such, Applicants respectfully request withdrawal of the § 102(b) rejection of claims 14-21. Each of claims 14-21 are believed to be in condition for allowance and such favorable action is respectfully requested.

The claims now pending in the application, namely claims 1-21 are in condition for allowance and such allowance is respectfully requested.

Respectfully submitted,



David Wade Schnell
Reg. No. 53,563

DWS/nlm

SHOOK, HARDY & BACON L.L.P.
One Kansas City Place
1200 Main Street
Kansas City, Missouri 64105-2118
816/474-6550

Attorney Docket No. UNVN.62457